

**CROSSOCERUS FLAVOMACULATUS, A NEW SPECIES OF THE SUBGENUS ACANTHOCRABRO FROM CHINA, WITH A KEY TO THE CHINESE SPECIES OF THE SUBGENUS (HYMENOPTERA: APOIDEA: CRABRONIDAE)<sup>1</sup>**

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**ABSTRACT:** *Crossocerus (Acanthocrabro) flavomaculatus* new species is described from the Beijing, Shandong, and Gansu Provinces in China. The first Chinese records are given for *C. (A.) vagabundus vagabundus* (Panzer): Sichuan and Yunnan Province, Tibet Autonomous Region, and *C. (A.) vagabundus koreanus* Tsuneki: Beijing, Inner Mongolian Autonomous Region, Hubei Province. A key to Chinese species is provided.

**KEY WORDS:** *Crossocerus*, *Acanthocrabro*, Hymenoptera, Apoidea, Crabronidae, China

The subgenus *Acanthocrabro* Perkins occurs in the Northern Hemisphere where it is represented by just five species: *amandali* (Bingham), from northern India; *maculipennis* (Smith), from North America; *nitidiventris* (Fox), from eastern North America; *sauteri* Tsuneki, from Taiwan, the only record of the subgenus from China (Tsuneki, 1977); and *vagabundus* (Panzer), a widespread Palearctic species. During our study of Chinese material of *Acanthocrabro*, we discovered a new species and also discovered that *A. vagabundus* occurs in China. The new species is described here and a key provided for the identification of the Chinese species of *Acanthocrabro*.

For the identification of the species of *Acanthocrabro*, we use the following subgenus characters: head without large, median, posteroventral projection; occipital carina not a complete circle; mandible with a tooth on inner margin, with 3 teeth in female and 2 or 3 teeth in male at apex; flagellomere III not swollen beneath; propleuron and forecoxa without lateral, large projections; mesothorax with mesopleural tubercle in female and most male, without mesopleural tubercle in few male; male with forebasitarsus usually sinuate or twisted spirally, metacoxa edentate apically; gaster yellow maculate, sessile; metasomal tergum II without large, rounded, deep depression; female with pygidial plate usually narrowed and excavated apically; male with tergum VII usually large, near broad triangular or semicircular, not coarsely punctate than penultimate tergum (Bohart and Menke, 1976; Krombein, 1979; Leclercq, 1954, 1974, 2000; Marshakov, 1980; Nemkov et al, 1995; Oehlke, 1970; Pulavskii, 1978; Tsuneki, 1954, 1968, 1990; Yeo and Corbet, 1983).

For the terminology we mainly follow Bohart and Menke (1976). The abbreviations HW, HL, POD, OOD, LTI, and WTI are used for head width, head length, postocellar distance, ocellocular distance, maximum length of tergum I, and maximum width of tergum I, respectively.

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## SYSTEMATICS

**Key to the females of the subgenus *Acanthocrabro* from China**

1. Clypeal margin with 5 teeth medially; vertex impunctate, scutum finely punctate; pygidial plate without median longitudinal carina; midfemur evidently swollen .....*C. (A.) sauteri* Tsuneki
- Clypeal margin with 2 or 3 teeth medially; vertex densely punctate, scutum coarsely, densely punctate; pygidial plate with or without median longitudinal carina; midfemur slightly swollen .....2
2. Clypeus, scutum, prepectus, mesopleuron, propodeal enclosure and gastral tergum I with large yellow spots; large portion of leg and gaster yellow; pygidial plate with or without median longitudinal carina (Fig. 2) .....*C. (A.) flavomaculatus* sp. nov.
- Clypeus, scutum, prepectus, mesopleuron, propodeal enclosure and gastral tergum I without yellow spot; small portion of leg and gaster yellow; pygidial plate with median longitudinal carina ...3
3. Orbital foveae large, shallow; mesopleuron sparsely punctate; gastral tergum V with large yellow spot.....*C. (A.) vagabundus vagabundus* (Panzer)
- Orbital foveae small, deep; mesopleuron densely punctate; gastral tergum V without yellow spot. ....*C. (A.) vagabundus koreanus* Tsuneki

**Key to the males of the subgenus *Acanthocrabro* from China**

[Male of *C. (A.) sauteri* Tsuneki is unknown]

1. Clypeal margin with three teeth (Fig. 3); mandible apex tridentate (Fig. 4); forefemur without projection at its hind surface; mesopleuron with mesopleural tubercle; propodeal enclosure, gastral terga I and IV with large yellow spots, coxa at apex and tibia yellow .....*C. (A.) flavomaculatus* sp. nov.
- Clypeal margin with broad, large, high median projection and one or two lateral teeth; mandible apex bidentate; forefemur with projection at its hind surface; mesopleuron without mesopleural tubercle; propodeal enclosure, gastral terga I and IV without yellow spot, coxa and tibia black .....2
2. Median clypeal projection broader than in next subspecies, clypeus with two lateral teeth; forefemur with a high, triangular projection at its hind surface ..*C. (A.) vagabundus vagabundus* (Panzer)
- Median clypeal projection narrower than in previous subspecies, clypeus with one lateral tooth; forefemur with a low, round projection at its hind surface.....*C. (A.) vagabundus koreanus* Tsuneki

***Crossocerus (Acanthocrabro) flavomaculatus*, NEW SPECIES**

(Figures 1-4)

**Diagnosis.** This species can be distinguished from *Crossocerus (A.) vagabundus vagabundus* (Panzer) and *Crossocerus (A.) vagabundus koreanus* Tsuneki by the following combination of characters: mandible apex tridentate in male (Fig. 4), clypeal margin with a low, blunt median tooth (Fig. 1, 3), mesopleuron with mesopleural tubercle, forefemur without projection at its hind surface, and propodeal enclosure and gastral tergum I with yellow spots in male; clypeus, scutum, prepectus, mesopleuron, propodeal enclosure and gastral tergum I with yellow spots in female.

**Description. Female.** Body length 8.1-9.1 mm. Head black, thorax and gaster black or dark brown; the following are yellow: mandible largely, clypeus largely, antennal scape, pedicel at apex ventrally, pronotal collar above, pronotal lobe, lateral spot on anterior portion of scutum, basal half of scutellum, hind portion of prepectus, upper spot on mesopleuron, lateral spot on propodeal enclosure, tegula partly, tibia largely, basitarsus largely, femur at apex, large lateral spot or transverse band on gastral terga I – V, small lateral spots on sterna II and III; metanotum with or without yellow spot; tarsomeres II – V largely yellowish brown or reddish yellow. Head and thorax with weak steel blue lustre.

Anterior margin of clypeus slightly prominent medially (Fig. 1). Mandible with three teeth at apex and a tooth at midlength of its inner margin. Frons without supra-antennal projection, with median

furrow; upper portion of frons and anterior portion of vertex densely, coarsely punctate, posterior portion of vertex densely, coarsely or finely punctate; vertex with large, oval orbital foveae. HW: HL: POD: OOD = 208: 141: 19: 31. Relative length of antennal scape: pedicel: flagellomere I: II: III: IV: V = 73: 16: 31: 17: 16: 16: 16.

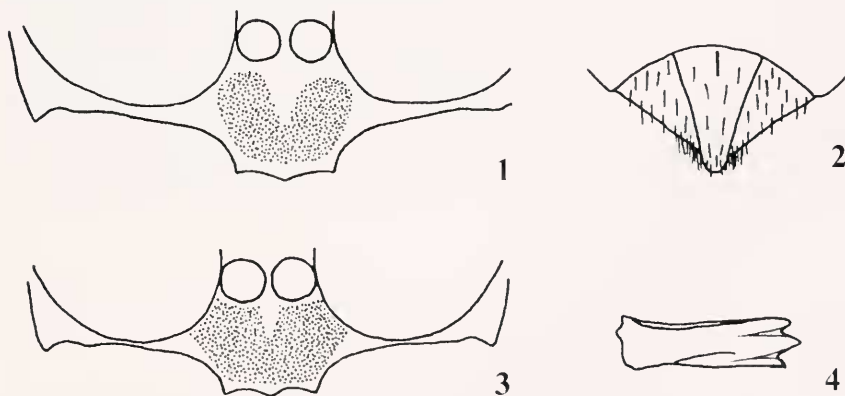
Lateral corner of pronotal collar round. Scutum densely, coarsely punctate, without longitudinal rugae adjacent to its posterior margin; scutellum sparsely or densely, coarsely punctate. Metanotum densely, finely or coarsely punctate. Mesopleuron densely, coarsely punctate, with mesopleural tubercle. Upper portion of upper metapleural area sparsely, finely punctate, lower portion of upper metapleural area and lower metapleural area without punctures. Propodeal enclosure delimited by furrow, with transverse furrow basally, with deep, V-shaped median furrow; posterior surface of propodeum with broad, deep median furrow on its upper portion, with sparse punctures, with short median carina, some transverse carinae and long or short lateral longitudinal carina on its lower portion; propodeal side with dense, fine, short, oblique rugae and punctures on its upper portion, with dense or sparse punctures on its median portion, without punctures on its lower portion. Hind tibia with spines on its outer surface.

Gaster not petiolate, tergum I sparsely punctate. LTI: WTL = 140: 141. Pygidial plate with or without short median longitudinal carina (Fig. 2).

**Male.** Body length 7.8 mm. The following are yellow: mandible largely, pronotal collar above, pronotal lobe, scutellum largely, anterior and posterior portions of prepectus, lateral spot on propodeal enclosure, coxa at apex, trochanter wholly or largely, fore and mid femora except lateral basal portion, tibia and basitarsus largely or partly, transverse bands on gastral terga I – IV, lateral spot on tergum VII, transverse bands on sterna II – IV.

Anterior margin of clypeus prominent medially, with low, blunt median tooth and lateral tooth on each side (Fig. 3); mandible with three teeth at apex (Fig. 4); orbital foveae smaller than in female evidently. HW: HL: POD: OOD = 175: 128: 17: 26. Flagellum ventrally fringed with white hair, apical segment normal. Relative length of antennal scape: pedicel: flagellomere I: II: III: IV: V = 54: 11: 26: 14: 12: 12: 12. Punctures on thorax and gaster smaller than in female evidently, mesopleuron densely or sparsely, finely punctate. LTI: WTI = 120: 127. Gastral tergum VII without pygidial plate.

**Material examined.** **Holotype.** ♀, China, Beijing, Malianwa, 8 June 1975, Chikun Yang; deposited in the Insect Collections of China Agricultural University, Beijing. **Paratypes:** 1♂, the same data as holotype; 1♀, China, Shandong Province, Taian, Mount Tai, 26 June 1992, Qiang Li, deposited in the Insect Collections of Yunnan Agricultural University, Kunming, Yunnan Province; 1♀, China, Gansu Province, Kou-ling, 13 September 1918, coll. Institute of Zoology, Academia Sinica, deposited in the Insect Collections of Institute of Zoology, Academia Sinica, Beijing.



Figs. 1-4. *Crossocerus (Acanthocrabro) flavomaculatus*, new species. 1-2. Female. 3-4. Male. 1, 3. Frontal view of clypeus. 2. Dorsal view of pygidial area. 4. Frontal view of mandible.

**Distribution:** China: Beijing, Shandong Province, Gansu Province.

**Etymology.** The name, *flavomaculatus*, derived from Latin *flavus* (= yellow) and Latin *maculatus* (= with spot), refers to the clypeus, scutum, prepectus, mesopleuron, propodeal enclosure and gastral tergum I in female and propodeal enclosure and gastral tergum I in male with yellow spots, which is one of the main recognition characters of the species.

***Crossocerus (Acanthocrabro) vagabundus koreanus* Tsuneki, 1957,  
NEW RECORD FOR CHINA**

**Material examined.** 1♀, China, Beijing, Baihuashan, 1200 m, May 28, 1973, Yongshan Shi; 3♀♀, China, Inner Mongolia, Chahar, Yangklaping, July 26, 1937 (1♀), July 29, 1937 (1♀), August 2, 1937 (1♀), O. Pie; 1♂, China, Hubei Province, Shennongjia, Dajuhu, 1800 m, August 1, 1981, Yinheng Han.

**Distribution:** China: Beijing, Inner Mongolian Autonomous Region, Hubei Province. Korea: Zokurisan, Taitimpyoo-Taihyoo, Keijio (Tsuneki, 1957:61).

***Crossocerus (Acanthocrabro) vagabundus vagabundus* (Panzer, 1798),  
NEW RECORD FOR CHINA**

**Material examined.** 1♀, China, Sichuan Province, Emeishan, Qingyinge, 800-1000 m, May 10, 1957, Zuocai Yu; 1♀, China, Yunnan Province, Zhongdian, Chongjianghe, 2400 m, August 8, 1984, Ruiqi Wang; 1♂, China, Tibet, Bemi, 2300 m, August 16, 1983, Yinheng Han.

**Distribution:** China: Sichuan Province, Yunnan Province, Tibet Autonomous Region. Palaearctic Region.

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